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Electronic Supporting Information (ESI):

### Electrochemiluminescence resonance energy transfer between methylene blue and Ru(bpy)<sub>3</sub><sup>2+</sup>-doped silica nanoparticles and its application in “turn-on” detection of glucose

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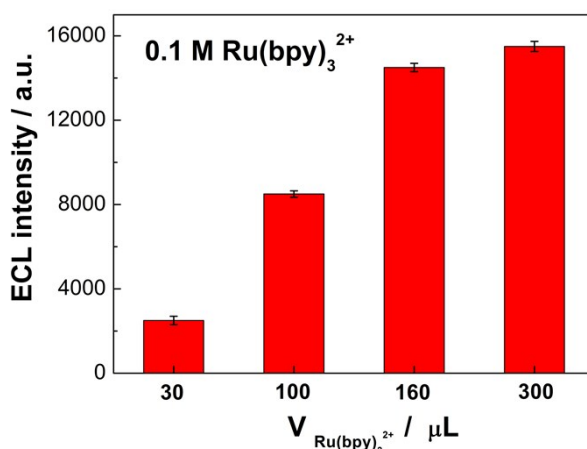
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#### Optimization of synthesized method.

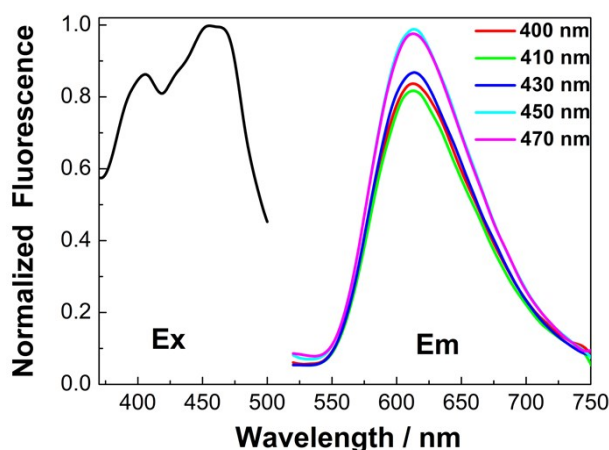
1. Optimization of the content of Ru(bpy)<sub>3</sub><sup>2+</sup> added during the synthesis of RuSiNPs.



**Figure S1** Optimization of the content of Ru(bpy)<sub>3</sub><sup>2+</sup> added during the synthesis of RuSiNPs. Different volume of 0.1 M Ru(bpy)<sub>3</sub><sup>2+</sup> from 30 μL to 300 μL is added to

synthesize RuSiNPs. 50  $\mu\text{L}$  of resuspended RuSiNPs is used in ECL measurement. 20 mM PB Buffer solutions: pH 12.01; The photomultiplier tube voltage is kept at 1000 V.

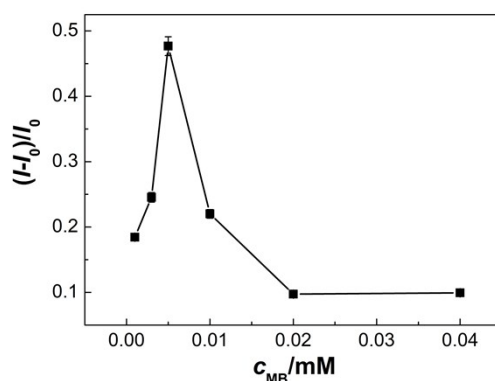
## 2. Fluorescent excitation (Ex) and emission (Em) spectra of the synthesized RuSiNPs.



**Figure S2** Normalized fluorescent excitation (Ex) and emission (Em) spectra of the synthesized RuSiNPs.  $\lambda_{\text{ex}}$  (nm): 400 nm, 410 nm, 430 nm, 450 nm and 470 nm;  $\lambda_{\text{em}}$ (nm): 610 nm.

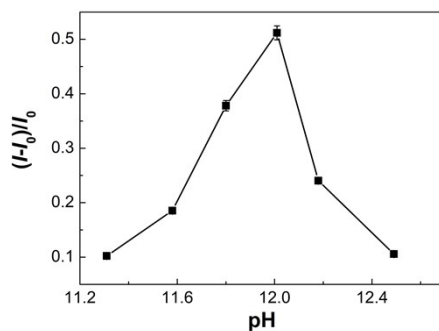
## Optimization of glucose detection method.

### 3. Effect of the amount of MB on ECRET detection of glucose.



**Figure S3** Effect of the amount of MB on ECRET detection of glucose.  $c(\text{MB}, \text{mM})$ : 0.001, 0.003, 0.005, 0.01, 0.02, 0.04;  $c(\text{Glu})$ : 50  $\mu\text{M}$ ;  $c(\text{RuSiNPs})$ : 32  $\mu\text{M}$ ;  $c(\text{TPA})$ : 1 mM; 20 mM PB Buffer solutions: pH 12.01; The photomultiplier tube voltage is kept at 1000 V.  $I_0$  represents ECL intensity of RuSiNPs and MB mixtures;  $I$  represents ECL intensity after the addition of glucose;  $(I-I_0)/I_0$  represents ECL increasing efficiency after the addition of glucose to RuSiNPs and MB mixtures. All the error bars represent the standard deviation of three measurements.

#### 4. Effect of pH on ECRET detection of glucose.



**Figure S4** Effect of pH on ECRET detection of glucose. 20 mM PB Buffer solutions, pH: 11.31, 11.58, 11.80, 12.01, 12.18, 12.49;  $c(\text{MB})$ : 5  $\mu\text{M}$ ;  $c(\text{Glu})$ : 50  $\mu\text{M}$ ;  $c(\text{RuSiNPs})$ : 32  $\mu\text{M}$ ;  $c(\text{TPA})$ : 1 mM; The photomultiplier tube voltage is kept at 1000 V. All the error bars represent the standard deviation of three measurements.